How to ensure patient observations lead to effective management of oliguria

Oliguria can be a sign of hypovolaemia and acute renal failure. Fluid balance must be accurately monitored so deficits can be corrected and complications prevented.

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Fluid balance is essential for normal functioning of the body. It helps to maintain body temperature and cell shape, and assists in the transportation of nutrients, gases and waste products (Docherty and Coote, 2006).

Disturbance in fluid balance during episodes of critical illness occurs for a number of reasons, including:

- Disruption to normal physiological mechanisms such as hypernatraemia (elevated sodium levels in the blood);
- Disease processes, for example acute renal failure;
- Side effects of treatment, for example diuretic therapy.

Oliguria (poor urine output) is a common sign of critical illness and is associated with poor fluid intake or excessive fluid loss. This article discusses the assessment and management of oliguria associated with hypovolaemia (low circulatory blood volume).

The condition is defined as the production of abnormally small amounts of urine – 100–400ml of urine in 24 hours (Smith, 2003). Definitions of abnormal urine output are listed in Box 1. It can be a sign that the patient is acutely ill and deteriorating (Jevon, 2008) and is usually associated with hypovolaemia (low circulatory blood volume) caused by restricted fluid intake or excessive fluid loss (Docherty and Coote, 2006). The causes of oliguria are listed in Box 2.

Early warning scoring (EWS) systems should identify oliguria so that timely and appropriate interventions can be carried out to re-establish urine output and protect renal function (Jevon, 2008). This may prevent further deterioration and progression to acute renal failure (Ahern and Philpot, 2002), which is a life threatening condition commonly associated with critical illness (Gwinnutt, 2006).

**MONITORING FLUID BALANCE**

Fluid balance is defined as the appropriate balance of fluid input and output over 24 hours. The fluid input over 24 hours in an average person should be approximately 1500–2500ml as liquid, 800ml in ingested food and 200ml as a by-product of food metabolism. Fluid output should be the same volume – 1500ml urine, 800ml of insensible loss such as sweating, and 200ml in faeces (Marcovitch, 2005).

During critical illness, fluid input and output should be monitored following local EWS protocols and the following should be recorded:

- Oral intake;
- Urine output;
- Wound and nasogastric drainage;
- All drug and fluid infusions (Adam and Osborne, 2005).

A positive fluid balance occurs when input exceeds output. This can occur when a patient’s IV fluids administration regimen is increased to rectify fluid volume deficits and dehydration.

A negative fluid balance occurs when output exceeds input, for example following treatment of fluid overload with diuretics (Brooker and Waugh, 2007).

It is important to monitor fluid balance accurately in critically ill patients so that deficits in fluid balance can be corrected and further complications prevented.

**MANAGING OLIURIA**

It is important to identify the cause of oliguria as early as possible so the most appropriate treatment can be instigated before complications occur (Jevon, 2008).

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The most common cause in the critically ill patient is hypovolaemia.

Absolute anuria is rare and is most likely to be caused by a blocked catheter (Ahern and Philpot, 2002).

Occasionally, oliguria can occur because patients have difficulty passing urine in hospital due to embarrassment and this should be considered when other causes have been eliminated.

Patients should be assessed following the Resuscitation Council UK’s systematic approach to the assessment of critically ill patients (Resuscitation Council UK, 2006) to ascertain whether they are critically ill. Ensure that appropriate senior help is called if necessary, following local EWS protocols. The following should be carried out:

- In critically ill patients, start prescribed emergency oxygen (Jevon, 2010a) and ensure they have a clear airway and are breathing adequately;
- In hypotensive patients, position them in a supine position if this is tolerated (Jevon, 2010b);
- Insert a urinary catheter to monitor output (Smith, 2003);
- Attempt to establish the cause of the oliguria. Perform a urinalysis – dark concentrated urine and a high specific gravity (SG >1.030) are features of volume deficit (Brooker and Waugh, 2007).

**In patients with a urinary catheter, ensure the oliguria is not caused by a mechanical problem, for example blocked or kinked catheter tubing:**

- Exclude retention of urine as the cause of oliguria (Gwinnutt, 2006);
- Arrange for IV cannulation to administer an intravenous fluid challenge and monitor its effect on urine output. It may be necessary to repeat the challenge (see Box 3); and
- Attempt to establish the cause of the oliguria. Perform a urinalysis – dark concentrated urine and a high specific gravity (SG >1.030) are features of volume deficit (Brooker and Waugh, 2007).

**Blood tests should be taken to monitor serum sodium, potassium, urea and creatinine levels. It may be necessary to measure the urine volume over 24 hours so that fluid and electrolyte balance can be assessed:**

- Regularly monitor fluid balance in combination with vital signs. Complete the EWS chart following local protocols;
- Ask the doctor to review the use of nephrotoxic drugs, for example, non-steroidal anti-inflammatory drugs (NSAIDs), gentamicin and ciclosporin as these may need to be discontinued;
- Seek medical advice for patients on diuretic therapy as this may need to be omitted if they are hypovolaemic.

**CONCLUSION**

Oliguria could indicate critical illness and it is important to assess the patient following the ABCDE approach and maintain an accurate fluid balance chart. Nurses should be aware of other causes of oliguria, including blocked catheters or urinary retention, and exclude these during initial assessment of the patient. If no other causes of oliguria can be identified, patient embarrassment about urination while in hospital may be causing the condition.

**REFERENCES**


